LIMERICK

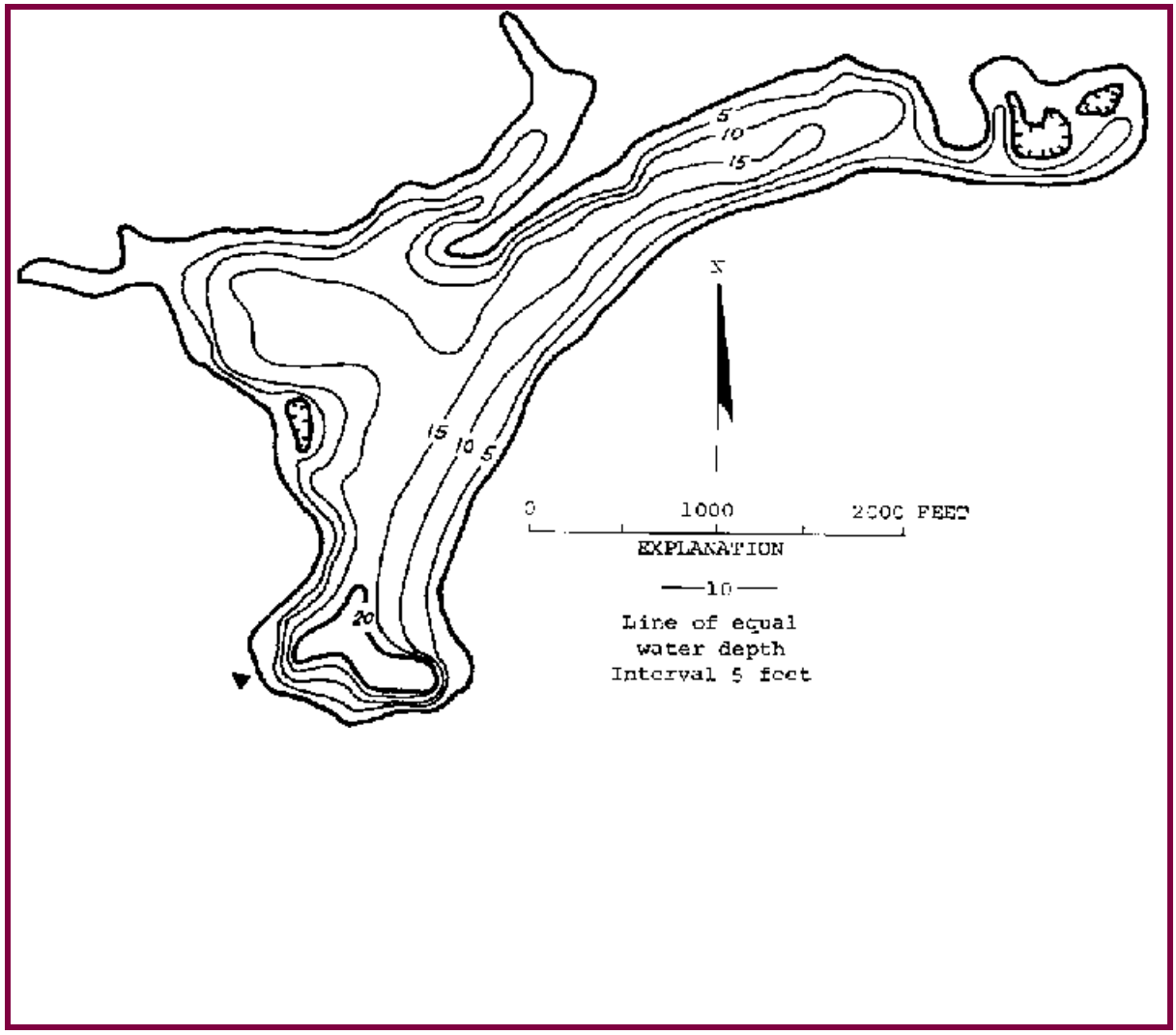
MASON County

Lake ID: LIMMA1

Ecoregion: 2

Lake Limerick is located about five miles northeast of Shelton. It was formed in 1966 by the impoundment of Cranberry Creek. Lake Limerick is fed mainly by Cranberry Creek, as well as three other minor inlets. The lake level is stabilized by a control weir at its outlet to Cranberry Creek.

Area (acres)	*Maximum Depth (ft)*	*Mean Depth (ft)*	*Drainage (sq mi)*	
129	24	9	13	
Volume (ac-ft)	***Shoreline (miles)***	***Altitude (ft abv msl)***	***Latitude***	***Longitude***
1210	4.39	220	47 16 59.	123 02 51.



Station Information

LIMMA1

Primary Station Station # 1 latitude: 47 16 48.8 longitude: 123 02 45.7

Description: Deep part of lake in approximate center of southernmost cove

Trophic State Assessment for 1998

LIMERICK

Analyst: KIRK SMITH

TSI_Secchi:	43
TSI_Phos:	36
TSI_Chl:	42
Narrative TSI:[a]	M

Lake Limerick is relatively low in nutrients (mean total phosphorus was 9.0 ug/L) but rich in aquatic macrophytes. It is surprising more nutrients are not showing up in the water column considering Cranberry Lake (a bog-like wetland with considerably higher nutrient concentrations) drains into Lake Limerick. It is possible that much of the total phosphorus is bound to sediment particles or accumulated in macrophyte biomass. The abundant aquatic plants appear to impair the beneficial uses of the lake more than the nutrient concentrations. Limiting the nutrients, however, will not necessarily reduce the aquatic macrophyte biomass because those nutrients typically come from sediment and not from the water column.

We recommend the ecoregional action value for oligotrophic Puget Lowland lakes (10 ug/L) be set as a total phosphorus criterion for Lake Limmerick.

[a] E=eutrophic, ME=mesoeutrophic, M=mesotrophic, OM=oligomesotrophic, O=oligotrophic

Chemistry Data

LIMERICK

Date	Time	Strata	Tot P (ug/L)	Tot N (mg/L)	TN:TP	Chloro-phyll (ug/L)	Fecal Col. Bacteria (#/100mL)	Hardness (mg/L)	Calcium (ug/L)	Turbidity (NTU)
Station 0										
7/27/1998		L					6			
		L					7			
8/18/1998		L					5			
		L					30			
Station 1										
6/4/1998		E	8.8	.186	21	2.8		21.4	4890	.9
7/27/1998		E	7.4	.247	33	2.4				1.3
		H	16.3	.269	17					
8/18/1998		E	9.6	.335	35	3.8				2
9/18/1998		E	10.4	.283	27	4.3				.8 J

Strata: L=lake surface, E=epilimnion, H=hypolimnion; Qualifier: J=Estimate, U=Less than, G=Greater than.

Watershed Survey

LIMERICK

Survey Date: 9/18/1998

Land Uses (1 = Primary, 2 = Secondary, etc.)

	Agriculture(commercial, not hobby)	1	**Residential**
	Commercial, Industrial	2	**Park, forest or natural**
	Major transportation		

Impervious surfaces (Roads and parking area): No Curbs

Observations (check mark denotes presence)

BMP's ☐

Lawns were mowed right down to the lake

Odors ☐

Cattle ☐ **Ducks** ☐ **Geese** ☑

Many geese use the lake. Volunteer has mentioned that geese have just recently produced offspring on the lake.

Fertilizers and weed killers appear to be used in residential or agriculture area ☑

On the neighborhood golf course and lakeside lawns

Buffer zones around streams and wetlands ☐

lacking on the inlet stream where homes are built and the stream is treated more like a canal than a stream

Irrigation ☑

at boat launch near the dam

Survey Id: 30

Habitat Survey Summary Report

LIMERICK

Data are averages of ***10*** **Stations Surveyed** **Date of Visit:** 7/8/1998

Vegetation Type (Avg. only of sites w/ vegetation present; 1=coniferous, 3=deciduous)

Canopy Layer Avg:	1.2	**Number of stations with canopy:**	10
Understory Avg:	2.4	**Number of stations with understory:**	10

Percent Areal Coverage (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)

Canopy Layer:	**trees > 0.3 m DBH**	2.4
	trees< 0.3 m DBH	0.7
Understory:	**woody shrubs saplings**	1.9

	tall herbs, forbs grasses	0.5
Ground Cover:	**woody shrubs seedlings**	1.5
	herbs, forbs, grasses	2.2
	standing water or inundated veg	0.2
	barren or buildings	1.9
Substrate Type (within shoreline plot):	**bedrock**	0.0
	boulders	0.2
	cobble/gravel	1.4
	loose sand	0.0
	other fine soil/sediment	0.4
	vegetated	3.1
	other	0.5
Bank Features:	**angle (O:<30; 1: 30-75; 2:nr vertical)**	
	vertical dist (M from wtrln to high wt):	0.2
	horiz. dist. (M from wtrln to high wt):	0.1

Human Influence (0 = absent, 1 = adjacent to or behind plot, 2 = present within plot)

buildings	1.1
commercial	0.0
park facilities	0.0
docks/boats	1.3
walls, dikes, or revetments	0.9
litter, trash dump, or landfill	0.2
roads or railroad	0.4
row crops	0.0
pasture or hayfield	0.0
orchard	0.0
lawn	1.3
other	0.1

Physical Habitat Characteristics

station depth (at 10 m from shore)	1.6

Bottom Substrate (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)

bedrock	0.0
boulders	0.0
cobble	0.4
gravel	1.3
sand	0.6
silt	3.0
woody debris	0.1

Macrophyte Areal Coverage (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)

submergent	1.7

emergent	0.6
floating	0.0
total weed cover	1.7
Do macrophytes extend lakeward (-1 = yes, 0 = no)	-1.0

Fish Cover (0 = absent, 1 = Present but sparse, 2 = moderate to heavy)

aquatic weeds	1.4
snags	0.0
brush or woody debris	0.2
inundated live trees	0.0
overhanging vegetation	0.7
rock ledges or sharp dropoffs	0.1
boulders	0.0
human structures	1.1

Zooplankton Report

LIMMA1

Date 6/4/1998 Station: 1 Sample ID 32

Lots of rotifers in sample.

Number of organisms measured: 180

Group	Percent
Cladoceran	31.7%
Copepod	68.3%
Other	

Group	Percent
Small < 1mm	91.7%
Large >= 1mm	8.3%
Ratio of large to Small:	0.09
Average size (mm):	0.48

Date 8/18/1998 Station: 1 Sample ID 28

Lots of rotifers, nostic and worms (!) in sample.

Number of organisms measured: 104

Group	Percent
Cladoceran	23.1%
Copepod	76.9%
Other	

Group	Percent
Small < 1mm	92.3%
Large >= 1mm	7.7%
Ratio of large to Small:	0.08
Average size (mm):	0.39

Aquatic Plant Data

LIMERICK

Sampler: Parsons, O'Neal Survey Date: 7/8/1998

Max depth of growth (M): 2.5

Comments Partly cloudy, calm. Vegetation survey done for Kirk Smith. Bullfrog. Did not survey whole shoreline carefully. Patches of dense P. amplifolius, thin leaved pondweed, many aeas with much algae and few plants. Egeria densa found during snorkling at launch in water ~ 2 m deep, widely scattered small plants, at islands patchy, some dense growth

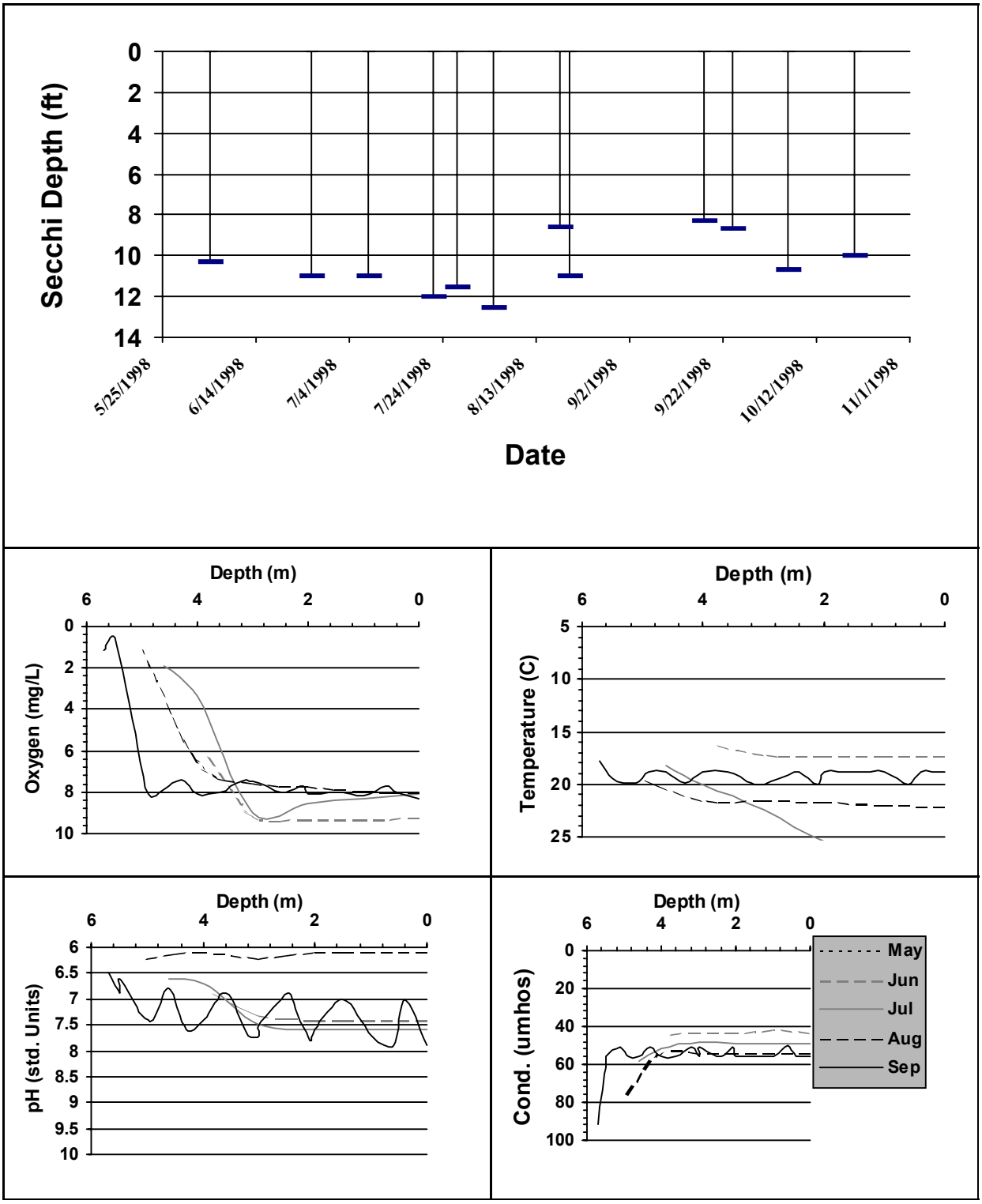
SPECIES LIST

Scientific Name	Common Name	Dist [a]	Comments
Brasenia schreberi	watershield	1	
Callitriche stagnalis	pond water-starwort	1	at one site
Carex sp.	sedge	2	on shore
Chara sp.	muskwort	3	shallow to deep water
Dulichium arundinaceum	Dulichium	1	near islands
Egeria densa	Brazilian elodea	1	patch around islands, and deeper water near launch
Elodea canadensis	common elodea	2	
Equisetum sp.	horse tail	1	
Juncus sp. or Eleocharis sp.	small grass-like plants	1	shallow gravelly areas
Juncus sp.	rush	2	on shore
Ludwigia palustris	water-purslane	2	on shore near inflow
Myriophyllum sp.	water-milfoil	2	near islands, probably M. hippuroides
Nitella sp.	stonewort	2	shallow to deep water
Potamogeton amplifolius	large-leaf pondweed	3	
Potamogeton gramineus	grass-leaved pondweed	1	1 patch seen
Potamogeton natans	floating leaf pondweed	2	
Potentilla palustris	purple (marsh) cinquefoil	2	
Potamogeton sp (thin leaved)	thin leaved pondweed	3	is P. pusillus
Sparganium sp.	bur-reed	2	
Utricularia inflata	big floating bladderwort	3	few blooming, much on the bottom
Vallisneria americana	water celery	1	in inflow area

[a] 0 - value not recorded (plant may not be submersed)
1 - few plants in only 1 or a few locations
2 - few plants, but with a wide patchy distribution
3 - plants in large patches, codominant with other plants
4 - plants in nearly monospecific patches, dominant
5 - thick growth covering substrate to exclusion of other species

Secchi Depth and Profile Graphics

Station: 1 LIMMA1



Secchi Data and Field Observations

LIMERICK

Date	Time	Temp-erature (F)	Secchi (ft)	Color (1-greens, 11-browns	Bright-ness (pct)	Wind (1-none, 5-gusty)	Rainfall (0-none, 5-heavy)	Aesthetics (1-bad, 5-good)	Swimming (1-poor, 5-good)	Geese (#)	Waterfowl (besides geese #)	Boats-Fishing (#)	Boats-Skiing (#)
Station 1													
6/4/1998		16.6667	10.25	7	100	1	1	5	5	30	16	0	0
	Sampler: SMITH			Remarks: FIRST TIME VOL HAS SEEN GOSLINGS ON LAKE. BLADDERWORT NOTICED, GREEN ALGAL MATS. MOSTLY TIMBER LAND IN WSHED. The Oxygen result is qualified as an estimate due to postcalibration failing QA/QC requirements.								
6/26/1998		17.8	11	7	75	2	4	5	5	0	0	2	0
	Sampler: WESTON			Remarks:									
7/8/1998		20.6	11	6	100	2	1	5	5	0	6	1	0
	Sampler: WESTON			Remarks:									
7/22/1998		24.4	12	6	0	1	1	5	5	0	0	1	0
	Sampler: WESTON			Remarks:									
7/27/1998			11.55		0			3	2	15	5	0	2
	Sampler: SMITH			Remarks: WATER UNUSUALLY CLEAR FOR LIMERICK. DEAD PLANTS IN WATER FROM HERB TREATMENT--MAKES FOR BORDERLINE SWIMMING CONDITIONS									
8/4/1998		23.3	12.5	6	0	1	1	5	5	15	6	0	0
	Sampler: WESTON			Remarks:									
8/18/1998			8.58	6	100			4	3	5	0	0	0
	Sampler: SMITH			Remarks: FEC#1 AT OUTFALL NEAR BOAT LAUNCH. FEC#2 AT COMMUNITY CENTER DOCK. The pH results are qualified as estimates due to postcalibration failing QA/QC requirements.									
8/20/1998		22.2	11	6	25	1	1	5	5	0		1	0
	Sampler: WESTON			Remarks:									
9/18/1998			8.25	6	90	1		4	3	2	1	0	0
	Sampler: SMITH			Remarks: The conductivity result is qualified as an estimate due to postcalibration failing QA/QC requirements.									
9/24/1998		18.9	8.66	8	100	3	1	5	5			0	0
	Sampler: WESTON			Remarks:									
9/24/1998			8.66		0					0	0	0	0
	Sampler: BELL-MCKINNON			Remarks:									

Date	Time	Temp-erature (F)	Secchi (ft)	Color (1-greens, 11-browns	Bright-ness (pct)	Wind (1-none, 5-gusty)	Rainfall (0-none, 5-heavy)	Aesthetics (1-bad, 5-good)	Swimming (1-poor, 5-good)	Geese (#)	Waterfowl (besides geese #)	Boats-Fishing (#)	Boats-Skiing (#)
10/6/1998		15.6	10.66	6	25	1	1	5	5		8	0	0
	Sampler: WESTON			Remarks:									
10/20/1998		13.9	10	7	0	1	1	5	3	0	102	0	0
	Sampler: WESTON			Remarks:	LAKE HEIGHT AT THIS TIME YEAR DUE TO REMOVAL OF BOARDS IN THE DAM TO HELP THE SALMON RUN. I COUNTED AT LEAST THREE SALMON IN BEAVER CREEK.								